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Polygonumins A, a newly isolated compound from the stem of Polygonum minus Huds with potential medicinal activities (Article)

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Abstract

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Polygonumins A, a new compound, was isolated from the stem of Polygonum minus. Based on NMR results, the compound's structure is identical to that of vanicoside A, comprising four phenylpropanoid ester units and a sucrose unit. The structure differences were located at C-3''''. The cytotoxic activity of polygonumins A was evaluated on several cancer cell lines by a cell viability assay using tetrazolium dye 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT). The compound showed the highest antiproliferative ($p < 0.05$) activities against K562 (Human Leukaemia Cell Line), MCF7 (Human breast adenocarcinoma cell line), and HCT116 (Colorectal cancer cells) cells. Cytotoxic studies against V79-4 cells were carried out and showed that polygonumins A was toxic at 50 µg/ml, suggesting that this compound may be used as an anticancer drug without affecting normal cells. Polygonumins A also showed promising activity as an HIV-1 protease inhibitor with 56% relative inhibition. Molecular docking results indicated that the compound possesses high binding affinity towards the HIV protease over the low binding free energy range of -10.5 to -11.3 kcal/mol. P. minus is used in Malaysian traditional medicine for the treatment of tumour cells. This is the first report on the use of P. minus as an HIV-1 protease inhibitor. © 2018 The Author(s).

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